What is the claimed is:

1. An inclining and rotating table apparatus comprising:

a rotating table device having

a rotating table, and

a support base for rotatably supporting said rotating table, said support base having at least one shaft body that is provided in a direction perpendicular to a rotation axis of said rotating table; and

a base for rotatably supporting said rotating table device using said shaft body as a rotation shaft, wherein:

a table surface of said rotating table is inclined by making said rotating table device rotate;

a first V-shaped groove is directly formed in said shaft body along the rotating direction thereof;

said base has a second V-shaped groove opposing said first V-shaped groove; and

a cross roller bearing is structured by

providing a plurality of rolling bodies between said shaft body and said base, said rolling bodies being placed in contact with said first V-shaped groove and said second V-shaped groove and being capable of rolling between said shaft body and said base, and

arranging a rolling axis of a rolling body, among said rolling bodies, perpendicular to a rolling axis of an adjacent rolling body.

2. An inclining and rotating table apparatus as claimed in

claim 1, further comprising:

an input shaft body for inputting power to said shaft body, said input shaft body having a cam surface whose phase is displaced in the axial direction of said input shaft body as said input shaft body rotates,

wherein said shaft body has a plurality of cam followers, said cam followers being provided at regular intervals on the outer circumference of said shaft body in the circumferential direction thereof, and said cam followers being placed in contact with said cam surface of said input shaft body to roll therewith, and

wherein rotation of said input shaft body causes said plurality of cam followers to subsequently engage said cam surface to make said rotating table device rotate.

3. An inclining and rotating table apparatus as claimed in claim 1, wherein:

said rotating table has a shaft portion as a center of rotation of said rotating table;

a third V-shaped groove is directly formed in said shaft portion along the rotating direction thereof;

said support base has a fourth V-shaped groove opposing said third V-shaped groove; and

a cross roller bearing is structured by

providing a plurality of rolling bodies between said shaft portion and said support base, said rolling bodies being placed in contact with said third V-shaped groove and said fourth V-shaped groove and being capable of rolling between said shaft portion and said support base, and

arranging a rolling axis of a rolling body, among said rolling bodies, perpendicular to a rolling axis of an adjacent rolling body.

4. An inclining and rotating table apparatus as claimed in claim 1, wherein:

one of said at least one shaft body is provided on said support base on one side of said rotating table device, and another one of said at least one shaft body is provided on said support base on the other side of said rotating table device;

said first V-shaped groove is directly formed in said shaft body provided on said one side;

a fifth V-shaped groove is directly formed in said shaft body provided on said other side; and

said base has a sixth V-shaped groove opposing said fifth V-shaped groove.

5. An inclining and rotating table apparatus as claimed in claim 1, wherein:

said rotating table has a holding mechanism for holding a workpiece; and

said workpiece held by said holding mechanism is made to incline and rotate by

making said rotating table rotate, and

making said table surface of said rotating table incline by making said rotating table device rotate.

6. An inclining and rotating table apparatus as claimed in claim 2, wherein said input shaft body is driven by a motor.

7. An inclining and rotating table apparatus as claimed in claim 6, wherein said motor is arranged so that it cannot be seen from outside said base.

8. An inclining and rotating table apparatus as claimed in claim 7, wherein:

power of said motor is transmitted to said input shaft body through a gear; and

said gear is arranged so that it cannot be seen from outside said base.

9. An inclining and rotating table apparatus as claimed in claim 7, wherein power of said motor is transmitted to said input shaft body without using a gear.

10. An inclining and rotating table apparatus as claimed in claim 3, further comprising:

a drive shaft for inputting power to said shaft portion, said drive shaft having a cam surface whose phase is displaced in the axial direction of said drive shaft as said drive shaft rotates,

wherein said shaft portion has a plurality of cam followers, said cam followers being provided at regular intervals on the outer circumference of said shaft portion in the circumferential direction thereof, and said cam followers being placed in contact with said cam surface of said drive shaft to roll therewith, and

wherein rotation of said drive shaft causes said plurality of cam followers to subsequently engage said cam surface to make said rotating table rotate.

11. An inclining and rotating table apparatus as claimed in claim 10, wherein said drive shaft is driven by a second motor.

12. An inclining and rotating table apparatus as claimed in claim 11, wherein said second motor is arranged so that it cannot be seen from outside said support base.

13. An inclining and rotating table apparatus as claimed in claim 12, wherein:

power of said second motor is transmitted to said drive shaft through a gear; and

said gear is arranged so that it cannot be seen from outside said support base.

14. An inclining and rotating table apparatus as claimed in claim 12, wherein power of said second motor is transmitted to said drive shaft without using a gear.